Combat Crew

30th anniversary issue

D301.81.26/3

UNIVERSITY OF FLORIDA LIBRARIES
APR 1976
DOCUMENTS DEPT.

★★★★

MARCH 1976

FLARE

Combat Crew

strategic air command

GEN. RUSSELL E. DOUGHERTY
COMMANDER IN CHIEF, SAC

MAJ. GEN. JOHN W. BURKHART
Deputy Chief of Staff, Operations

COL. JESSE S. HOCKER
Director of Safety

STAFF

MAJ. RICHARD W. BLATTER
Editor

G. FRANCIS FARRELL
Associate Editor

AIC GERALD F. MORIARTY
Art Editor

MARY JANE ABBOUD
Editorial Assistant

UNIV. OF FLORIDA LIBS.
DOCUMENTS DEPARTMENT
U.S. DEPOSITORY

Contents...

Articles

Thirty Years For SAC 4
Honorable Profession 8
On Speed 12
A New Concept 16
Everyone's Business 20

Features

Hangar Flying 14
Professional Performers 22
Big Instrument 24
Flying Safety Rates 25
Safety Screen 31

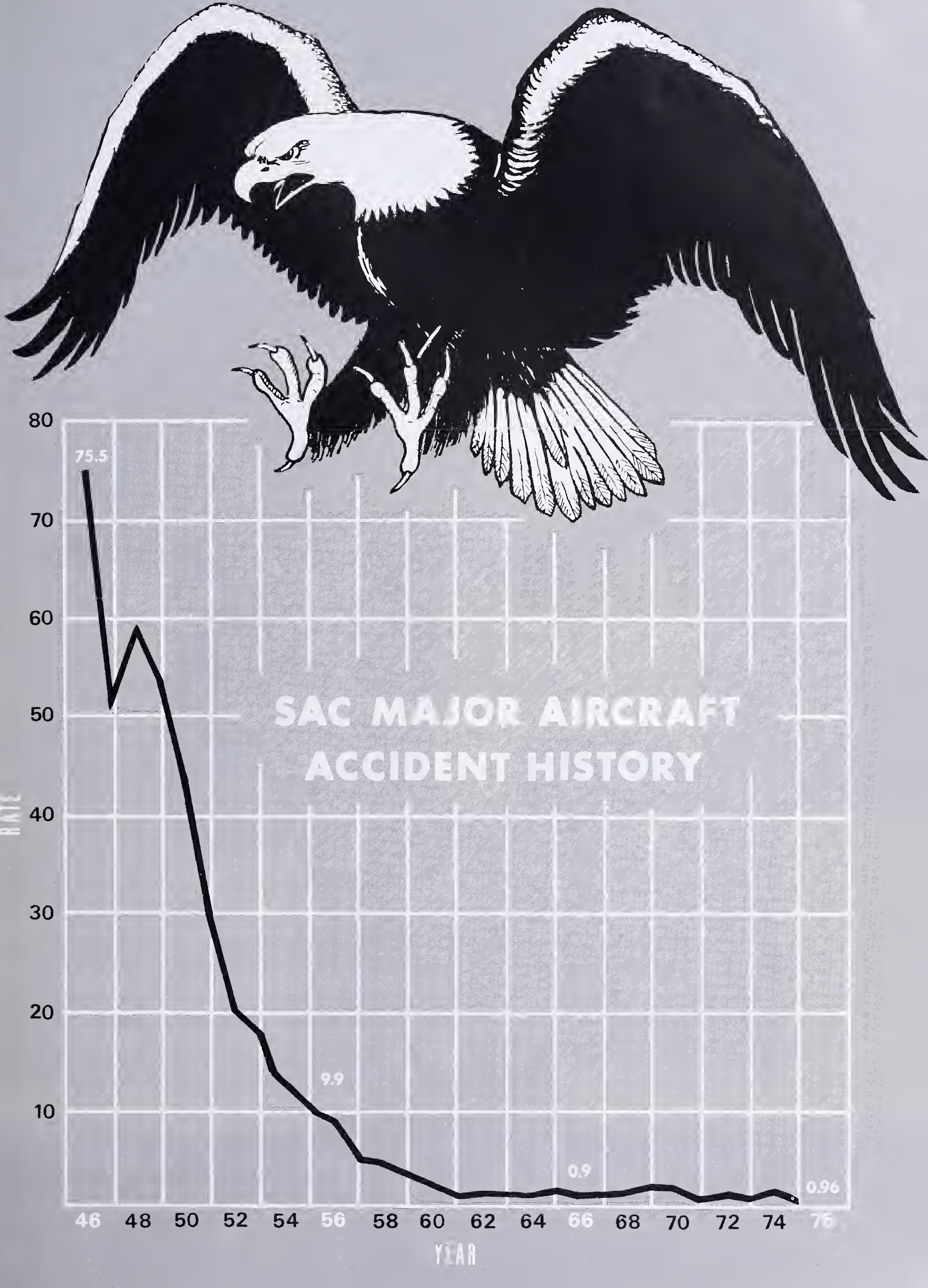
ON OUR COVER

A salute to SAC's 30th Anniversary and the Spirit of '76.

26

SACRP 127-1 **VOL. XXVII, NO. 3** **MARCH 1976**

COMBAT CREW is an internal publication of the Strageic Air Command with the sole purpose of promoting safety. The contents of this magazine are informative and not to be considered as directive in nature. Facts, testimony and conclusions of all accidents printed herein may not be construed as incrimination under Article 31 of the Uniform Code of Military Justice. All names, dates and places used in conjunction with accident stories are fictitous. Written permission must be obtained from Headquarters, Strategic Air Command, before any material may be reprinted by other than U.S. Air Force organizations. Use of funds for printing this publication has been approved by Hq. USAF. Contributions are encouraged, as well as comments and criticisms. Direct correspondence with the Editor is authorized. Address correspondence to Editor, COMBAT CREW, Hq. SAC (DOSE), Offutt AFB, Ne. 68113.



SAC MAJOR AIRCRAFT ACCIDENT HISTORY

Highlights of the men, aircraft, missiles and the accomplishments that led the world into a new concept of deterrence . . .

THIRTY YEARS FOR

To perpetuate the strategic bombing superiority that helped bring Allied victory in World War II, the Strategic Air Command was created on March 21, 1946.

Strategic Air Command observes its 30th anniversary this month — the historic date, March 21. On that day three decades ago, SAC was established as a separate command of the United States Air Force, and the men of the new organization set out to build a strategic air arm second to none. An air arm that today is an awesome force.

THE HERITAGE

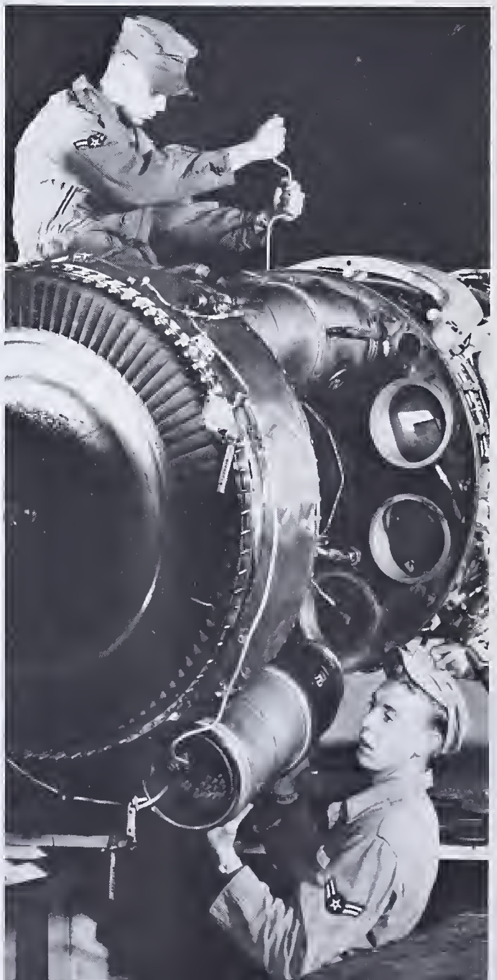
Although the theory of strategic bombing goes back to the days of World War I and General Billy Mitchell, 1935 is referred to as one of the most important milestones in a strategic air power. That year saw the production of the four-engine B-17, Flying Fortress, a long range bomber that demonstrated for the first time the potential possibilities of strategic air power. Actually, the B-17 was to have the opportunity to prove itself much sooner than expected. Within five short years, the Japanese struck at Pearl Harbor on December 7, 1941, and the United States found itself engaged in a worldwide struggle for survival. All too soon the need for a vastly larger fleet of long range bombers was obvious, and a hard-pressed nation set out to build that force as quickly as possible.

The air fleet was built and before the leaders of the free world met at the historic Casablanca Conference of January 1943, the belief of American air leaders in the doctrine of strategic bombing had been justified. In Europe, the Germans had already felt the devastating effect of large-scale, daylight bomber attacks made by the Eighth Air Force in England and the Fifteenth Air Force in the Mediterranean Theater. The stated objectives of these attacks — "The destruction and dislocation of the German military, industrial and economic system and the undermining of the morale of the German people to the point where their capacity for armed resistance is fatally weakened."

SAC ★ ★ ★ ★ ★

A B-52 releases "iron bombs" on targets in South East Asia. From June 1965 to January 1973, B-52s flew conventional bombing missions almost daily against enemy forces in Vietnam. B-52 strikes continued in Laos until April 1973, and in Cambodia until August 1973. During Linebacker II, 18 to 29 December 1972, combat operations over North Vietnam were highlighted by the B-52 in a strategic bombing role. Flying over 700 sorties in an 11-day period, B-52 crews penetrated one of the most heavily defended areas of the world, characterized by heavy concentrations of SAMS, MIG fighter aircraft, and anti-aircraft emplacements, successfully striking key military targets in the Hanoi/Haiphong area. By 28 December, the North Vietnamese air defenses had been practically neutralized, and on the last two days of Linebacker II, the B-52s were able to fly over Hanoi and Haiphong without any damage. On 30 December, North Vietnam announced that it was ready to resume peace negotiations. The B-52s had achieved their objective.

The Peacemaker — In June of 1948, the first B-36 was delivered to the 7th Bomb Group at Carswell and served well for more than ten years. On 12 March 1949, a B-36 from the 7th set a long distance record when it completed a 9,600 mile flight in 43 hours and 37 minutes without refueling.

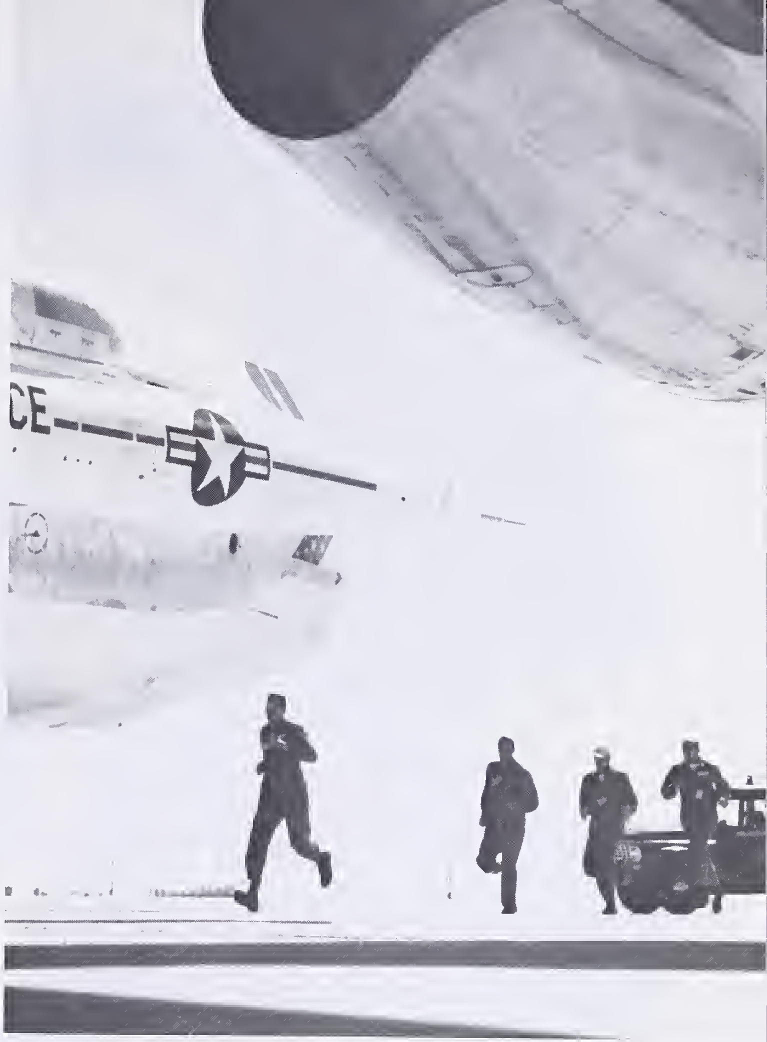


So, for the first time in history, there developed an air war with a strategy and tactics all its own. Shortly thereafter, on April 16, 1945, General Carl Spaatz was able to announce: "The strategic war in Europe has been decisively won." Then and only then was the nation able to turn its full attention to the war with Japan, and soon that enemy was to feel the full power of strategic bombing. The extraordinary damage inflicted on the Japanese homeland by strategic bombing, coupled with the atomic bomb drops on Hiroshima and Nagasaki, were ultimately responsible for the victory over Japan that came without a costly ground invasion. Thus, World War II drew to an end as the air campaigns in Europe and the Far East demonstrated once and for all the military potential of air power and the important significance of strategic bombing.

1946-1976

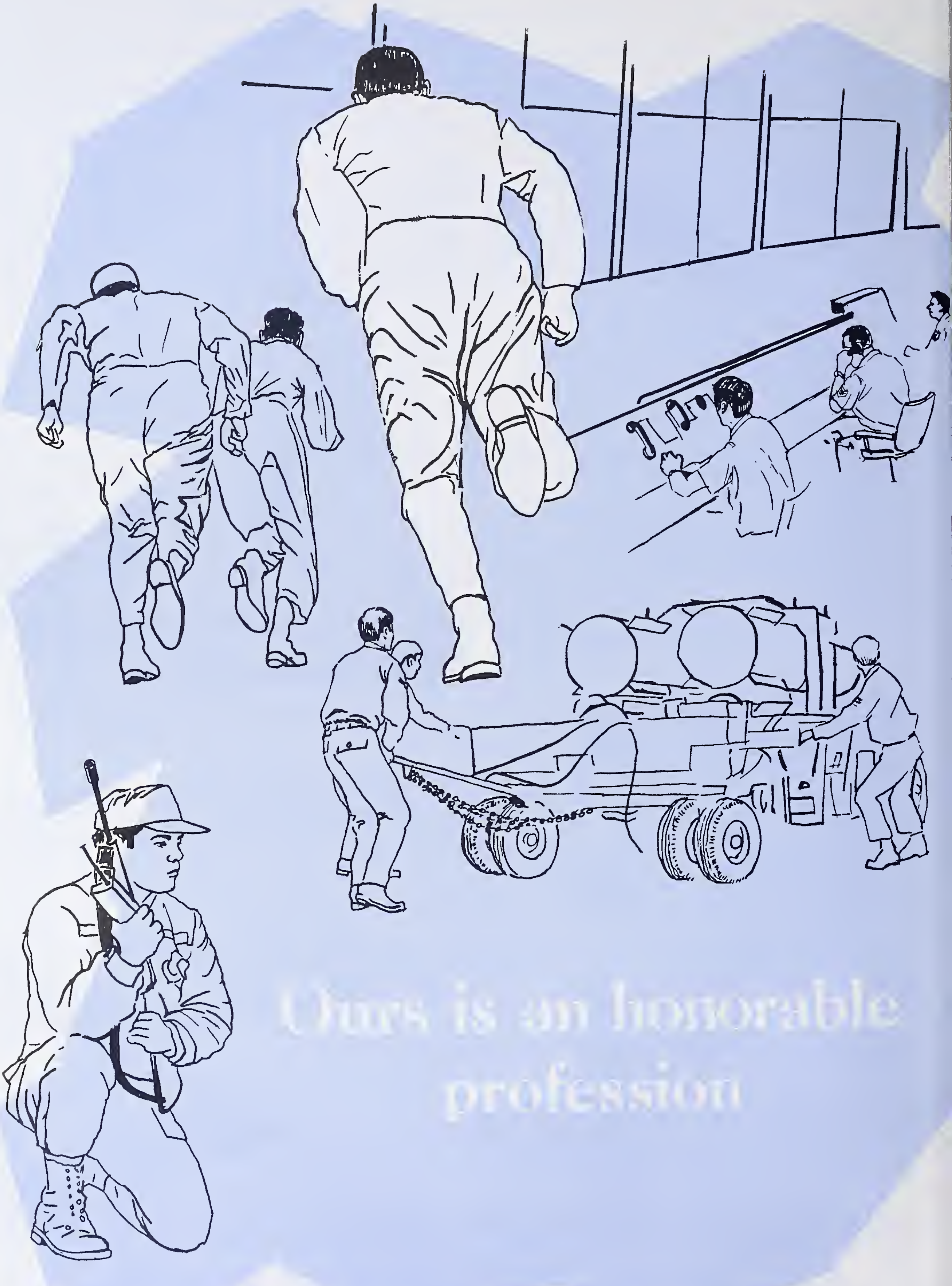
Within a year after the cessation of hostilities, a nation more wise in the ways of war directed the establishment of the Strategic Air Command. Designed to concentrate the global strategic bombardment force in a single command, the new organization was formed at Bolling Air Force Base under the command of General George C. Kenny. Given the responsibility for developing a strategic atomic striking force that would serve to protect the peace through massive deterrent power, SAC had

continued on page 26



Since going on ground alert on 1 Oct 1957, SAC aircrews have maintained a constant 24-hour a day alert posture.

KB-29P tanker refuels with B-50 receiver.



Ours is an honorable profession

Editor's Note: For last May's issue of **Combat Crew,** our Commander in Chief contributed a "CINCSAC Comment" which turned out to be one of the most effective pieces we've published. It was called, "Ours is an Honorable Profession," and it said most of the things many of us felt about how one ought to behave as a member of the military profession. Moreover, it said them better than most of us could ever hope to. Since its publication, we have received many favorable comments and requests for reprints. In this year of observance — 200 years for our nation, 30 years for SAC — we need to recall with pride a glorious past, and to provide rules, admonitions, and guidelines by which the good things of yesteryear may be retained for the future. In reviewing past issues of **Combat Crew,** it occurred to us that General Dougherty's article would be a superior vehicle for the latter cause. Projecting ourselves 30 years into the future — to 2006 — if we would again read "Ours is an Honorable Profession," we would find it a useful guide for the combat crewmember and all other members of the Air Force. "Ours **is** an honorable profession — because it **must** be; there is no other way." With the author's permission, we, therefore, reprint General Dougherty's comments as a prescription for a professional Strategic Air Command — any time.

F. Scott Fitzgerald once remarked to Ernest Hemingway: "You know, the rich are different from you and me." Hemingway rejoined: "Yes. They have more money."

There is also a difference between the average citizen of the United States and the citizens who also serve our country as volunteer members of the uniformed military establishment. And the distinction is much more fundamental than the mere fact that we wear a distinguishing uniform while performing our duties — we are different because we have more obligations.

We are different as a matter of our Constitution and our statutory law. The Constitution of the United States specifically provides that the Congress shall make **laws** for the governing of the Armed Forces of this country. As Americans, we in the Air Force are, of course, subject to the laws generally applicable to U.S. citizens. But there are many additional laws and regulations (with the force and effect of law) to which we in uniform must adhere . . . we must comply with general regulations, orders, rules of conduct, management, and standards prescribed for the military. Many of these laws, regulations, and orders to which we must adhere establish far more prescribed standards of behavior and performance for military people than those governing our general civilian society. These higher standards of performance are both proper and necessary, because the requirements for the proper discharge of military missions and duties **are** more demanding and stringent than the standards of conduct for those not in the military service. In short, military people live and work in an environment which imposes unique obligations and standards upon the performance of its people. This concept of a separate military society, with its own special rules, has been validated by the U.S. Supreme Court.

As members of the United States Air Force, we **are** subject to different and increased obligations — and we are **expected** to be different from **Mr.** John Doe . . . or **Ms.** Jane Doe . . . in our dress, our appearance, our conduct, in the routine performance of our jobs, and in the sacrifices we may have to make because of our military duties and obligations. There is no aspect of our military service in which these differences are more pronounced than that associated with our combat crews — our missile, tanker, bomber, or reconnaissance crews.

You are, of course, familiar with the details of the special rules and regulations necessary to insure that you meet the requirements of your particular job and the conduct expected of Air Force personnel. The reasons for these more stringent rules and greater expectations are simple, valid, and compelling. We are sworn to defend this country against all of its enemies. We are equipped with billions of dollars worth of facilities and weapon systems — all provided from the public treasury. We have charge of the use of thousands of nuclear weapons with devastating potential. This country has an absolute right to expect — indeed, demand — that our stewardship of these public resources and sophisticated weapons be discharged with absolute responsibility and reliability. Our reliability must extend both ways: to do what we are required to do by established authority — and to do it well . . . and not do that which is not authorized.

The twin hallmarks of our military profession are **integrity** and **responsibility.** These are honorable characteristics and ours is an **honorable** profession. Integrity and responsibility must permeate all of our thoughts, words, and deeds. Our integrity must be absolute and unequivocal. There is no aspect of our Air Force duties that requires us to lie, cheat, steal, or resort to chicanery in order to be successful. Indeed, such despicable behavior is the very antithesis of the qualities essential to success in our military profession.

If we are to secure and maintain public trust in our reliability, we must be completely open, candid, and honest in our operations, staff work, relationships with others, and handling of government funds and materials. Nowhere are personal integrity and responsibility more important than in our combat crews . . . and we must never forget it!

Strict adherence to doctrine, procedures, and technical orders is essential to safe, effective operation and maintenance of our equipment. Failure to do so can degrade our operational capability, damage or destroy valuable equipment, and injure or kill precious people. If you think you know a **better** way to do things, you owe it to your colleagues in the profession to share that knowledge. I urge you not to shortcut or circumvent the approved system on your own initiative. Rather, I urge you to apply your knowledge and your initiative to changing our procedures and doctrine through the established and proper channels. Our doctrine and procedures are dynamic, as are our regulations. They can and should be changed when circumstances change and

we recognize a better way to do things. But until the rules we live by are changed, we must discipline ourselves to abide by the letter and spirit of our regulations. After all, our rules and standards are the product of careful deliberations — not malice or whimsy — to provide the best possible means to accomplish our ends. In our Command and in our Service, responsible and objective questioning is encouraged . . . but we cannot tolerate disobedience toward established authority.

Integrity and responsibility must also be hallmarks of our staff work. Honest, thorough, balanced staff work is essential to sound decision-making. The bad news must be told, as well as the good. There are those who use their staffing of an issue to "sell" their (or their boss's) preferred solution to the decision-maker, and "stack the deck" by slighting, obscuring, or even omitting alternatives or information worthy of consideration. The "best" solution should be able to stand on its own merits after competing fairly with its rivals. To win a rigged decision is not a success — it is chicanery. It is a waste of the decision-maker's time and talent, a disservice to the organization he represents, and a failure of integrity and responsibility on the part of those perpetrating the fraud.

Compliance with our many rules and regulations concerning combat crew performance is often evidenced through documentation — "paperwork." These records are necessary — or we wouldn't have them. They serve a very useful purpose — if only to insure accomplishment and record the qualitative achievements of the action being documented. Unfortunately, from time to time there are a few among us who — through indifference, negligence, or just plain laziness — attest to performance that did not occur (or was only partially completed), rationalizing that no real harm has been done . . . "It's just bureaucratic paperwork." Even if there is "no harm done," integrity has been compromised. And any compromise of our integrity **is** harm, for it picks away at the threads of an individual's, or a command's, moral fiber; it weakens our capacity to meet further challenges to integrity; and it destroys our credibility with the citizenry of the country we are sworn to defend.

Our rules and regulations are not meant to degrade or denigrate anyone. Nor are they designed to reduce everyone to conformity with the "least common denominator." Rather, they seek to lift up the performance of everyone to the highest standards of responsibility and effectiveness.

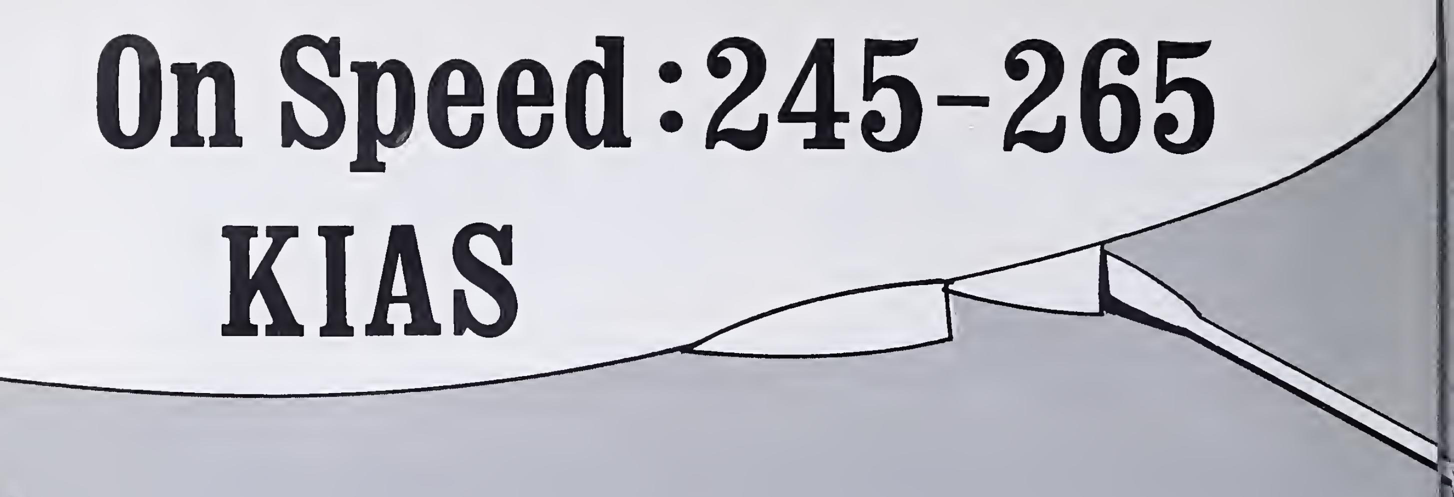
Do you measure **up?** Or, do you demean yourself by seeking escape and evade the discipline that distinguishes military professionals? Do you "give an honest day's work for a day's pay?" This, too, is ultimately a test of integrity. No matter how great or small your job, it is your responsibility to perform that job to the best of your ability all the time.

Our SAC people **are** our most valuable resource; also, people have fast become our most expensive resource. And, of all our SAC people, those of you in the combat crew force represent the most expensive. The ability to accomplish SAC's vital mission is inseparable from the dedicated, highly professional efforts of our personnel. We cannot turn our mission on and off like a faucet. Our readiness cannot run hot and cold. Our constancy of purpose requires persistence of effort. When we give less than our best, we are cheating on our responsibilities to the nation that is depending for its security on our faithful performance; depending on us to give the best of our ability, in conformity to the highest standards of professional excellence. No one in SAC is insignificant. Everyone in SAC is needed. But the man or woman who "eases off on the throttle" denies his service — and himself — the realization of his full potential. Like a muscle that isn't exercised, he becomes weak and, in time, cannot be counted on to pull a fair share of the Command load.

There are also a few misguided individuals among us who think the end justifies the means — that "the mission," "getting the job done," "it's only results that count" is all that matters — no matter how accomplished. These are the few who, in their zeal to win high marks for themselves or their unit's performance, cut corners or falsify reports in order to keep it "looking good." Loyalty to the unit and dedication to the mission are fine attributes expected of SAC personnel, but our readiness and capability to perform our vital mission must be based on demonstrated capability and upon unimpeachable facts . . . not on contrived documentation. Should the ultimate test be required of us, it will be true results that really count — not paper successes or papered over failures. This is why our Command has insisted on absolute integrity in the measurement of our achievements as well as our deficiencies. This is why SAC has put such emphasis on inspections, standboards, and competitive activity . . . to be sure that our capability is valid. This is why we have put such a premium on absolute integrity on the part both of the evaluator and the evaluatee.

Our mission and duty impose upon each of us heavy, individual burdens of responsibility and dependability. We are bound by solemn oath, lawful regulations, and public trust to fulfill these responsibilities without fail, and — if necessary — at the risk of our lives. Continuing to deserve and maintain the trust of those who rely upon us, and continuing to meet the extraordinary high standards demanded of us, depend — as they have always depended — upon our integrity and our responsibility. Ours **is** an honorable profession — because it **must** be . . . there is no other way.★★★★

On Speed: 245–265 KIAS



Captain Dwayne Hicks
46 AREFS, K. I. Sawyer AFB

The takeoff, climbout and rendezvous with the receiver had been uneventful. With clear weather and no turbulence, Capt Perry Pilot monitored the boom's occasional instructions to the B-52 while the copilot computed his fuel offload. The navigator had rolled the tanker out on a good heading down the refueling track, and now unseen gallons of JP-4 gushed successfully from the tanker to the bomber. Perry Pilot, having completed the potentially most troublesome segment of the flight, relaxed his grips on the throttles and looked out his window to view the washed-out colors of the Midwest's quilt blanket landscape. His eye caught a small civilian aircraft far below which, at his altitude, looked like it was skimming the tree tops. He interrupted his thoughts briefly to glance back inside the cockpit, noticed his airspeed had risen a few knots, and made a slight but effective adjustment on the throttles, confirmed a few seconds later by the boom's voice over UHF radio: "Back four."

He knew that each throttle adjustment would have to be followed by an appropriate bomber throttle adjustment, but he also knew that the Air Refueling Manual stipulates a refueling airspeed of 255 KIAS and the sooner he corrected his airspeed, the more accurate it would remain.

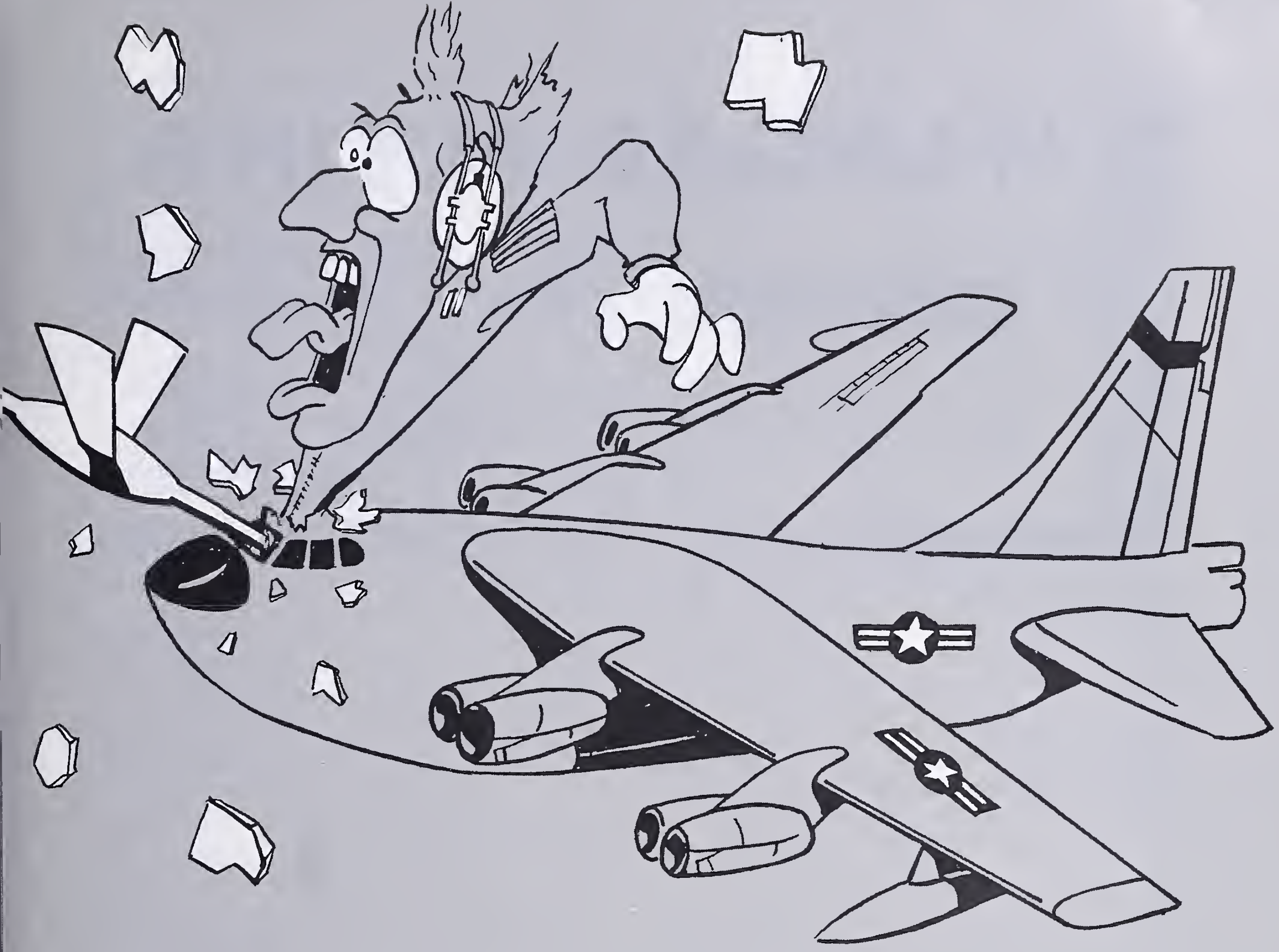
Having checked the other cockpit instruments, he returned to his window reverie, a chance wisp of cloud reminded him of a blond wisp of hair which had graced his arm the night before. Amid these more interesting thoughts, the boom called a disconnect, and the receiver pilot notified the tanker that he was moving back in order to make a seat change.

Perry Pilot winced to see that his airspeed had once again climbed a few knots and, as before, made an appropriate throttle adjustment, a little larger this time since the receiver was a safe fifty or so feet back. The boom operator, focusing his attention inside, performed his checklist transitioning from "tanker normal" to "tanker manual."

If this situation had been a scene from a movie, the sound track at this point might have begun a musical theme of incipient disaster to unseeing victims while the camera recorded the unalterable advance of behemoth aircraft toward the aft end of the tanker. The movie audience, teeth clenched and arm rests gripped, might then have witnessed the boom crashing through the receiver's windshield, his sudden depressurization, and also the death spiral of a tanker bereft of a horizontal stabilizer.

I'll leave it to the reader of this story to write the ending as gory as he likes but let us concern ourselves now with two issues. The obvious one is that all participants in an air refueling must at all times be aware of their counterpart's position and relevant actions. Less obvious is the issue of tanker pilot airspeed control.

Many tanker aircraft commanders have refueled bombers for years, religiously maintaining an airspeed of 255 KIAS while making frequent, unannounced throttle adjustments. This practice cannot only cause more work for the receiver, but also be dangerous if the participants are caught unaware. In addition, many have decided to make their adjustments while the receiver is far behind rather than in



the envelope by reasoning that the receiver pilot has a greater time of reaction at the greater distance.

However, the safest time of throttle adjustment is actually when the receiver is close, because it is then that his attention and that of the boom operator are fully focused on the position of their respective aircraft.

Although the Air Refueling Manual gives us 255 KIAS for air refueling, SACR 60-4 requires only that refueling operations be conducted at an airspeed range of 245 to 265 KIAS. This range not only allows us to pass our checkrides, but also allows us, in the interest of safety, to make less frequent throttle adjustments resulting in a much smoother platform for the receiver pilot. In addition, one can inform the receiver of each throttle change without cluttering up the radio with frequent calls.

Parenthetically, this procedure and air refueling airspeed range must be revised whenever the gross weight of the tanker is such as to cause the endurance speed to approach the airspeed range of air refueling. Note number one of the Air Refueling Mission Planning and Inflight Data chart gives us the reason for this:

> *If the tanker gross weight is such that 255 KIAS is less than charted endurance speed, endurance speed will be used as air refueling speed for B-52/C-5A receivers to provide better acceleration capability. This speed change will be coordinated with the receiver as soon as possible.*

Thus, the same principle applies, but sooner, at an airspeed of 245 KIAS. For example, with a tanker gross weight of 225,000 pounds, the best endurance airspeed is 248 KIAS. This would result in a new air refueling airspeed range of 248 to 265 KIAS.

So use your whole airspeed range for air refueling and let your receiver know when you make a throttle change. Not only will it make air refuelings easier for you and your receiver, but it may keep you from becoming the subject of a disaster movie.

For more on the subject of air refueling technique see Hangar Flying in this issue. Ed.

HANGAR FLYING

CENTRAL FLIGHT INSTRUCTORS COURSE

Information in these articles is nondirective. The purpose of hangar flying is to share experiences and stimulate interest in safe, effective techniques. If you know a better way, send it to:

HANGAR FLYING
4018 CCTS/CFIC
CARSWELL AFB TX 76127

How to stop chasing airspeed with throttles.

This is the first in a continuing series of articles written by the instructors of CFIC. To get off to a flying start the first article will be about the most controversial subject on air refueling — tanker throttle technique. On this subject everyone is an expert, for example:

"Our unit is having a lot of ice-shield damage and actual breakaway calls. It must be the receiver's low experience level."

"The receiver pushes the tanker so I pull the power back a little just as I get a contact."

"I move the throttles anytime. As long as the change is less than 50 pounds fuel flow the receiver never complains."

"Just hold airspeed constant — a constant speed makes it easy for the receiver."

"I don't know how much speed tolerance I've got during a checkride so I hold it right on 255 knots."

"Don't touch the throttles at all even during the offload — the extra speed will help the receiver." Confusing, isn't it? These viewpoints have been around for years and have one thing in common — they overlook basic formation coordination and lead platform techniques. One reason there is so little exchange of information is that air refueling is a formation where the leader is always the tanker. The tanker doesn't usually get a chance to fly the receiver aircraft to get feed back on techniques. However CFIC bomber and tanker crews have exchanged views on refueling over the years freely, and perhaps their techniques would be useful. We need to get back to basics.

The tanker is the leader of a trail formation and should use the techniques taught in Undergraduate Pilot training to make it easy for the receiver, and provide the receiver with a stable platform.

For example, changes of thrust and drag are usually announced, acknowledged and executed simultaneously on all aircraft in the formation. It would be discourteous at best to accelerate away or toward your buddy without warning him.

With regard to throttle technique, an air refueling involves keeping thrust and drag balanced so there is no movement toward or away from the receiver unless the receiver is advised that movement is about to occur. Before we recommend throttle technique, we need to consider two things — airspeed and relative position.

AIRSPEED

You should know in advance how fast or slow the receiver can go. For example a B-52G or H can fly easily at 240 KIAS or 300 KIAS (slipway door limit). Unmodified D-model B-52's are further limited to 290 Knots max speed.

If the receiver is heavy, he may want to operate at faster speeds — say 260 or 270. Take advantage of the entire speed range allowed rather than attempting to hold a constant speed. For example, with 255 as a reference speed on an evaluation flight, you can fly anywhere from 245 to 265 autopilot ON and 240 to 270 autopilot OFF. A novel way to look at it is the entire range between the minimum and maximum speed is ON SPEED. Since the entire speed range is qualified there are no brownie points for holding a single speed in the center of the ON SPEED tolerance block. Increases in evaluation tolerance would make the platform even easier and safer. Altitude can be traded for airspeed if necessary to avoid making power changes. For example an altitude change of 100 feet will change airspeed by 3 knots. If your autopilot is OFF, the 300 feet altitude tolerance can be used to your advantage to keep airspeed within the ON SPEED ballpark. This 600 foot block has a potential speed exchange of 18 knots — over half of the ON SPEED between 240 and 270.

RELATIVE POSITION

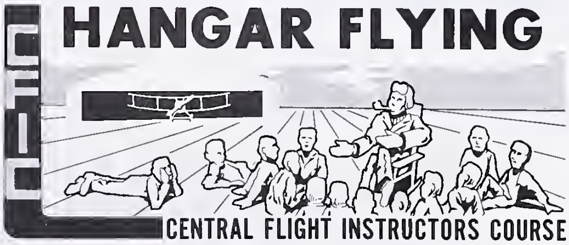
While airspeeds during refueling are measured in nautical miles per hour, the relative position of the airplane is measured in feet and inches. During dry contacts any throttle movement will move the tanker relative to the receiver and force the receiver to chase the tanker with at least three throttle movements: first to return toward the desired relative position, second to stop movement and third to reset the new power position. If the receiver leaves his power set, uncoordinated throttle movements of 1/16 inch would run the fore and aft limits. An uncoordinated throttle change is especially critical if the receiver has dropped back to change seats since he is distracted and has less depth perception cues. For example, from 300 feet away, a tanker power decrease of only 1/8 inch could move the tanker backwards at a closure rate that probably won't be noticed until a collision is unavoidable. Keeping in mind that airspeed is less important than a stable platform to maintain relative position, here are two techniques to fly a great platform.

TECHNIQUES

During the offload, the platform can be maintained by gradually reducing thrust at the same rate drag is decreasing — approximately .03 EPR units per 5000 lbs of offload. It's a good idea to precompute the total EPR change to avoid overshooting the final end-offload EPR. For example, a 30m offload would require a total of .18 EPR decrease. If 2.27 was the EPR at the start of the offload, the throttle movement aft should stop at 2.09 EPR. Since this technique maintains a constant thrust and drag balance, the receiver need not be advised. Intended thrust changes, except for the offload should be coordinated with the receiver. For example, the conversation might sound like this; "Boom, this is pilot — where is he?" "In the green, pilot." "Receiver 21, this is tanker 72, I need to reduce power about a half knob width." "Rog 72, go ahead." "OK — 72 is pulling power back — NOW." Sound familiar? Sure, it's ordinary formation technique. If the power had been changed without telling the receiver, he would have moved toward the inner limit.

The receiver should be advised to change power at the same time the tanker does, and be confident that tanker power won't change unexpectedly. Excessive and uncoordinated tanker power changes can greatly frustrate the best receiver pilots.

The next article will discuss control input techniques during refueling. In the meantime try these throttle techniques so that you and your receiver will have an easier and safer refueling.



TRAINING: A NEW

CONCEPT

Captain Robert S. Klinger
Det 35, Headquarters SAC
Operations Training Support Laboratory

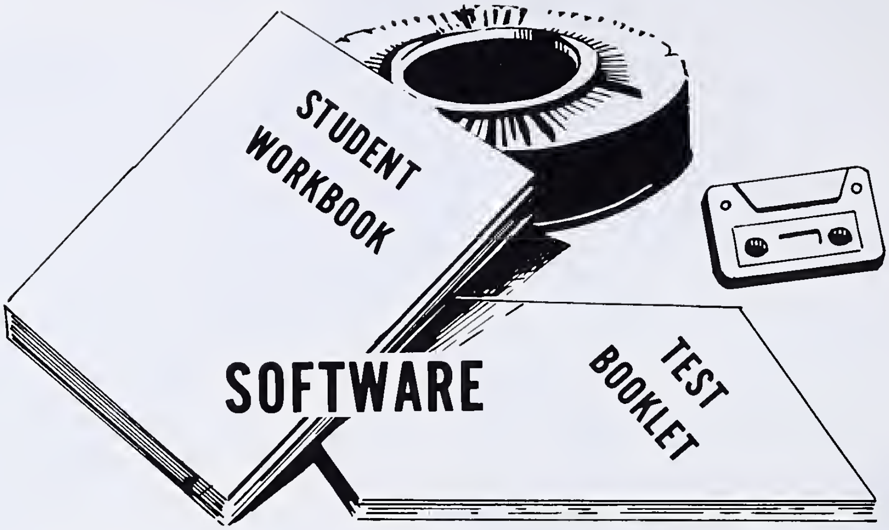
SAC crew members are familiar with the rapid advances that have been made in training techniques in the past few years. As part of the effort to continually improve the training program for combat crews, the Strategic Air Command has approved a new training concept. The program will give commanders a professional training package that will open new avenues of instructional capabilities to the instructor. In addition, it will provide the crew members with standardized training in less time with increased retention.

This new program involves the distribution of the Caramate II audiovisual teaching machine and the production of training materials to be used with this equipment. The program is being implemented by the SAC Director of Training and is conducted by the Operations Training Support Laboratory (OTSL) at Carswell AFB, Tx. It is the culmination of over two years researching and testing by OTSL.

The Caramate II is a 35mm slide projector with a built-in screen combined with a cassette audio tape player. A teaching lesson or a briefing using 35mm slides narrated by the audio tape can be viewed by a single individual or by a group. The audio tape contains special tone pulses that control the slide projector. As the tape is played, the slides change automatically in synchronization with the narration. The audio tape can be programmed to stop itself to allow the student time to complete a workbook, answer a test item, or to study technical data. The student can then restart the tape to continue the instruction.

Not only will the student be able to "teach himself" with the Caramate II, he will also become an active participant in the learning process by interacting with the machine, depending upon the type of program being presented. This interaction leads to better understanding of the training material, and the student can review the material as many times as he desires. In addition, use of the synchronized sound/slide format will allow crew members to receive a complete lesson without the aid of an instructor. Because of this, training can be administered at the crew member's convenience. With the use of headphones, the student can participate in training in any environment with minimum interruptions or distractions.

SAC units will receive two versions of the Caramate II: A recorder/playback model, and a playback only machine. With the recorder/playback version, units will be able to construct their own training programs or local briefings. For example, units can produce such items as standard instru-



Software for the Caramate II will consist of a set of 35mm slides, a cassette audio tape, and a variety of workbooks, tests, and technical data. The software is being designed to promote active participation of the student with the instruction. Programs on a variety of ground training subjects are being prepared by OTSL for automatic distribution throughout SAC. Local units will also have the capability to produce their own programs.

ment departure, ORI, and unit mission briefings. Software production instructions will be provided to all units. These instructions will present detailed how-to procedures covering script writing, photography, graphics, sound recording, and other useful information needed to produce software. To provide additional training for instructors, the Air Training Command offers formal instruction in sound/slide program preparation. This training, entitled the Audiovisual Methods Course (3AZR75000-6), is taught at Sheppard AFB, Tx. Consult AFM 50-5 for application procedures. This is an excellent course that will enable instructor personnel to produce quality sound/slide programs.

OTSL has recently added audio and photographic processing equipment that provides the capability to mass produce sound/slide software for SAC. Production has started on SACR 50-24 recurring ground training subjects in the sound/slide format. As programs are completed, they will be automatically distributed to operational units. Distribution will be controlled in the same manner as OTSL videotape products. OTSL also reproduces sound/slide programs that are used by the B-52, KC-135, and FB-111 Combat Crew Training Schools. While these programs are designed for initial combat crew instruction, they may be used for recurring training whenever possible. These programs will be listed in the next revision of the OTSL Catalog and can be ordered from OTSL.

Distribution of all Caramate II equipment will be completed by 30 April 1976. The Caramate II distribution chart shows the amount and models of equipment that will be delivered to SAC units. Caramate playback models will be placed in each bomber and tanker alert facility. Aircrew life support training areas will also receive a playback machine. Missile wings and other units listed in the chart will receive playback models for use in their crew training areas. Recorder/playback models will be supplied to each unit DOT.

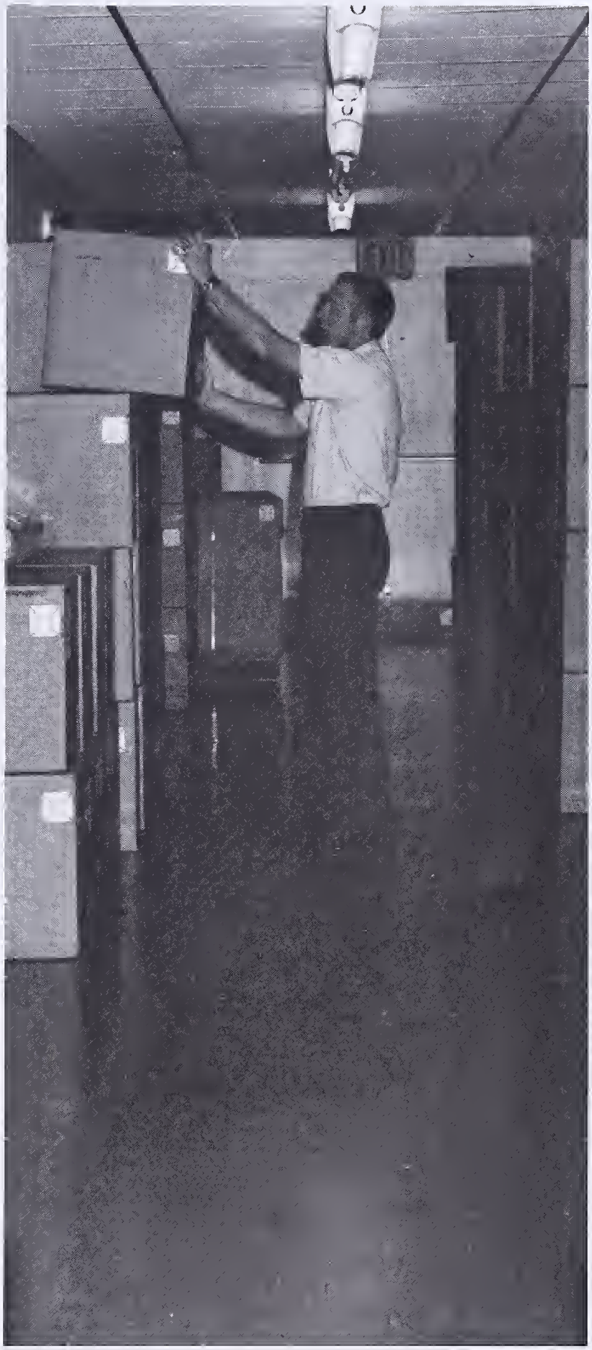
Equipment maintenance will be performed by a central repair facility at Offutt AFB. If a Caramate II fails to operate, a quick Autovon call followed by a message is all that will be required to receive a replacement unit. This procedure will insure minimum down time for your Caramate II equipment. Local maintenance will be limited to projector bulb

CARAMATE II DISTRIBUTION

TYPE UNIT	PLAYBACK ONLY	RECORDER/ PLAYBACK
BOMB WING	3	1
AIR REFUELING WING	3	1
MISSILE WING	1	1
STRAT RECON WING	1	1
STRATEGIC WING	1	1
11TH AND 916TH ARS	2	1
1 CEVG		1
3901 SMES		1
1, 2, AND 4 ACCS		1
8TH AND 15TH AF HQ DOT		1
CINCSAC/DOTP		1

change and tape head cleaning. Full maintenance, repair, and operating instructions are being supplied to each receiving unit.

If you are a Commander or Director of Training, this new concept will expand your training program by providing standardized, centrally produced, professional software. It will greatly increase your ground training capabilities. If you are an instructor, this program will allow you to devote more time to individualized instruction and will create an exciting format for new, creative instruction. If you are a crew member, you will receive a fresh approach to recurring training. You will also be able to review a lesson as often as you wish or progress as fast as your ability will permit. This new concept is for you — the commander, the instructor, and the most important part of SAC, the combat crew member.



ABOUT THE AUTHOR

Captain (Major selectee) Klinger is the Instructional Systems Development Production Officer for Detachment 35, Headquarters Strategic Air Command at Carswell AFB. As a manager of sound/slide production, he coordinates the training materials produced by Det 35 for all SAC aircraft Combat Crew Training Schools and various Hq SAC agencies. He has served as a Minuteman Missile Combat Crew Commander with the 90th SMW standardization division at F. E. Warren AFB and as an Airborne Launch Control System Plans Officer with the 4 ACCS at Ellsworth AFB. He is a graduate of Texas Technological University and holds a Master's degree from Texas Christian University.

SAFETY
is
Everyone's
Business

Captain Jerry I. Grabeklis
9 SRW

Whether you fly airplanes, launch missiles, bend wrenches, operate booms, stare at radar scopes or drive a bread truck, the following is for you.

A successful safety program is the result of many factors, the most important of which is active, individual involvement by concerned people. Unfortunately, in most cases, "people involvement" can only be obtained through gentle prodding or sometimes outright coercion. By using these two methods, the results are far less than desired.

But why is there such a clear-cut requirement for every person in an organization to get involved with safety? The reason becomes obvious if we examine the foundation of a good safety program, a foundation which resembles a three legged stool. The stool stands firmly, even on a cobblestone floor. However, if one leg collapses, so does the stool. A sound safety program is supported by three legs . . . engineering, education, enforcement. To understand why "people involvement" strengthens the three supporting pillars of safety, we must look at each pillar individually.

Good engineering is probably the starting point of a successful program. A machine that is easy to operate, or a well graded curve in the road are typical examples of good engineering and design. But engineering not only refers to design of machines and environmental factors, it also involves compiling the procedures we use to accomplish our assigned tasks. How safe would "light bulb changing" be if the procedure called for one person to hold the bulb while another turned the ladder. Of course this example is a gross exaggeration, but analyze the routine tasks you perform day after day. You may find some that are equally ridiculous.

After the initial engineering phase comes the important task of education. It does no good to design and build efficient, convenient machines and procedures if people don't know how to use them. Consider a simple, double yellow line on the highway. It serves no useful purpose if drivers don't know why it's there. Or imagine a person pushing a board through a radial saw with small, sharp particles of wood randomly flying about while a pair of safety goggles hangs nearby. This is what safety education is all about. The driver must know why the yellow lines are on the road and the novice handyman has to know why eye protection needs to be worn.

Unfortunately, the third supporting element of a good safety program, enforcement, has negative connotations for too many people. To them, enforcement means "don't do this," "don't do that," or "that's prohibited." They feel enforcement is a harassing technique designed to make their lives miserable. On the contrary, exactly the opposite is true. Enforcement controls deviations from safe practices, deviations which are dangerous not only to the deviator but to innocent bystanders. For example, consider the 15 miles per hour speed limit in most military housing areas. It's reasonable; some people understand why it's so low. If they don't, one experience with a darting child will open their eyes. Yet there are some who habitually speed through congested housing areas. Enforcement, in their case, reduces our chances of having to witness a terrible tragedy . . . a dead or crippled child.

At this point you're probably asking yourself how "people involvement" relates to the three E's of safety. After all, we have professionals handling these tasks. Engineers do the designing, the safety office does the educating, and supervisors and security police do the enforcing. The answer is simple. The job is too big for the "pros" to handle alone. They need your constructive advice and help.

"People involvement" keeps the three supporting elements of a safety program workable. It's you, the individual, who is the primary user of machines and procedures. You're the one who should tell the engineers how well a tow bar or checklist is working. You're the one who should tell the educators if information is getting through and if it's correct. You're the one who should report a gross speeding violation. You should because you're the one who will struggle with the clumsy machine or procedure, learn from an ambiguous lesson plan, and pay excessively high insurance rates.

Remember, the "professionals" give you a tool to work with or a road to drive on. They teach you how to use it safely, and even remind you to do just that. But you're the one who makes the final determination on how well the entire operation works. Make a suggestion to someone next time you find yourself holding a light bulb while your buddy is turning the ladder; complain about the tall vegetation that blocks your view at an intersection; hang the "habitual" speeder. Get involved.

PROFESSIONAL PERFORMERS

Pilot

U-2 Pilot Captain Donald E. Hatten, 349 SRS, 100 SRW, Davis-Monthan Air Force Base, is SAC Pilot of the Month.

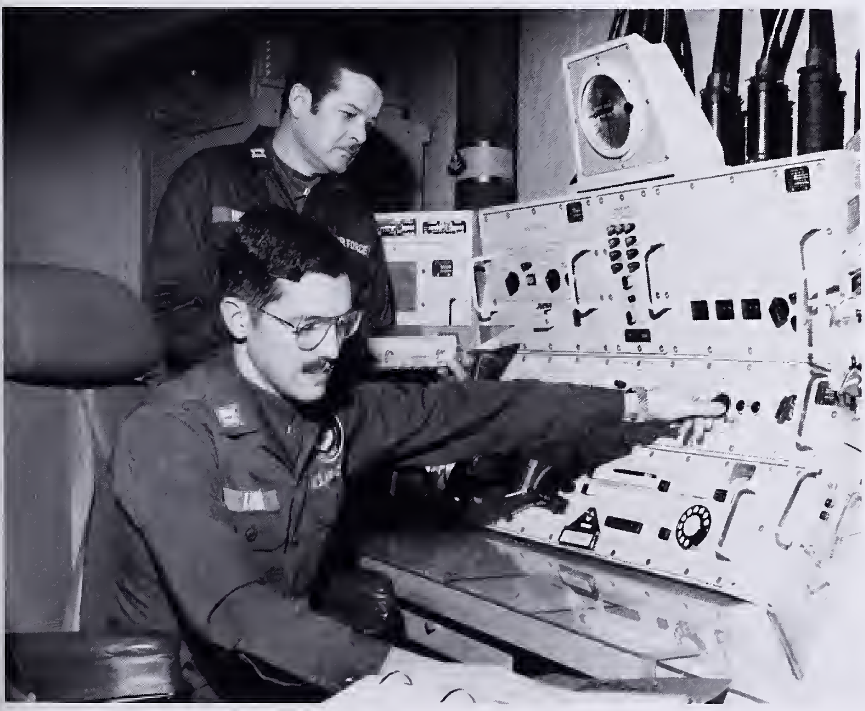
456 Bombardment Wing, Beale AFB, B-52 Crew: AC Captain Robert W. Nelson, CP Captain Mark W. Peterson, RN 1Lt Charles M. Lyons, N 1Lt Charles I. Bennett III, EW 1Lt Ronald E. Eubanks, and AG Sgt Jack H. Sabins have been selected as SAC's Flying Crew of the Month.

Flying Crew

Individuals selected for these pages as SAC's top professional performers of the month are chosen from nominations made by all SAC units. Selection is made only after all nominations have been carefully screened and those chosen meet the highest standards of excellence as outlined in SACR 127-2.

TITAN Crew R-180, 390 SMW, Davis-Monthan AFB: MCCC Capt Jack E. Nelson, DMCCC 1Lt William E. Hetzler, MSAT SSgt Terry L. Keefer, and MFT A1C Richard G. Gibson.

MINUTEMAN Crew R-185, 341 SMW, Malmstrom AFB: MCCC Captain Thomas Luisi, and DMCCC Captain Larry G. Hoover.



BIG INSTRUMENT

AIR REFUELING OPERATIONS

By

Capt. John L. Wilson, 1CEVG

Are you completely familiar with SACR 55-3, Chapter 5, Air Refueling Operations? Since air refueling is an integral part of SAC's mission, complete familiarity with this regulation is necessary to insure maximum safety within the Air Traffic Control system. Close coordination with ARTCC is required to insure that they are aware of your requirements both during refueling and prior to A/R formation breakup.

Transition from the Air Refueling formation to the enroute structure is one area that requires particularly close attention by aircrews. During the A/R, ATC is treating the formation of two or more aircraft as one aircraft (for traffic control purposes). They assume that whatever the lead aircraft (tanker) does, the other aircraft will do also. At end A/R when the aircraft are going their separate ways, the formation leader must separate the aircraft and coordinate their movement back into the traffic system. Since ATC has no way of knowing where the aircraft are in the airspace block, it is important for aircrews to coordinate with ATC during this phase of flight.

The first requirement of ATC is to know the altitudes desired by each aircraft at the end air refueling point. They need this information at least five minutes prior to termination for proper coordination and clearance. A delay in passing this information to center results in a delay in receiving your clearance to proceed with the rest of your mission.

The next consideration is to tell center the relative position each aircraft will be exiting the track. FAA Handbook 7610.4C tells the controllers that you will be exiting the track with the aircraft requesting the higher enroute altitude at the highest altitude **to the maximum extent practical.** It's the phrase "maximum extent practical" which can throw in the confusion factor for the controller. Due to track length, training requirements, weather, and any number of other problems, this is not always practical; therefore, you should notify center exactly how you are going to exit the track. Passing this information will make the breakup easier for you and gives center maximum information to help you get on with the rest of your mission.

TRANSPONDER OPERATION

Have you noted the new transponder requirement in FLIP General Planning? No aircraft may operate in controlled airspace above 12,500 feet MSL without an operational transponder having a Mode 3, 4096 code capability and automatic pressure altitude reporting capability (Mode C). Deviations to this may be authorized by ATC on an individual basis, but traffic conditions in some parts of the U.S. may keep you from receiving this authorization. When the transponder fails while airborne there is not much you can do except attempt to recycle the system. A careful and thorough checkout on the ground, however, can help prevent your departing with an inoperative transponder. Use the procedures contained in your Dash One and if one of the modes doesn't check out properly, call maintenance.

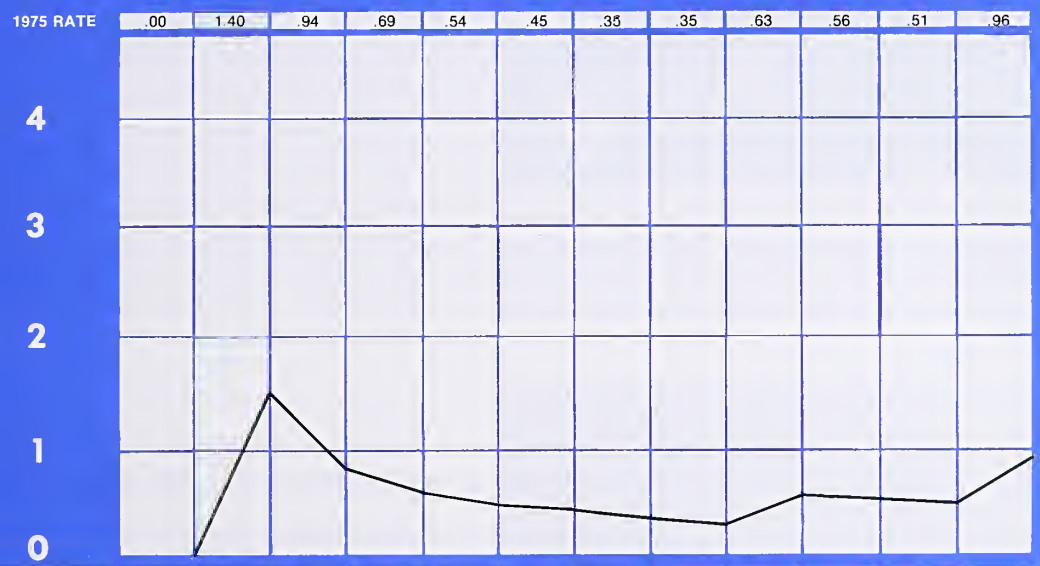
One more note on transponder operations. When changing Mode 3 settings, do it quickly and accurately. With the automated radar system, a pause on the wrong code or inadvertently setting the wrong code could result in a misidentification by the ARTCC computer and an erroneous display to the controller.

LOW ALTITUDE ALERTS

The automated radar system with altitude readout makes it possible for ATC to issue low altitude alerts to aircraft which, in the controller's judgment, are in unsafe proximity to terrain or manmade obstructions. This sounds great, but before you sit back and quit worrying about hitting the ground, keep in mind that the controller's primary responsibility is to provide radar spacing of aircraft and provide orderly flow of air traffic. Therefore, low altitude alerts are contingent upon the controller observing the unsafe condition. The controller is a busy person and cannot watch your altitude readout continuously. The primary responsibility for remaining well clear of the ground still remains with the crew and ultimately with the aircraft commander.

1976 Flying Safety Rate

★ SAC MAJOR ACCIDENT RATE (PER 100,000 FLYING HRS)



ACCIDENTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1975	0	1	0	0	0	0	0	0	1	0	0	2
1976	0	1										

1976 SUBORDINATE CMD RATES

ACCIDENT STATUS

-135	FEB 76

LEGEND ⁀ =1975 RATE

The record-making, record-breaking Hustler. After being delivered to SAC in August of 1960, the B-58 went on to set and break many of the world's aviation records. Among them were three new speed records set in a 4-hour and 41-minute round trip flight between New York and Los Angeles.

continued from page 7

an awesome task to accomplish in the coming years. But under the leadership of commanders in chief from General Kenney to General Dougherty, and through the evolution of concepts and strategies, the command molded itself into a highly trained and dedicated force that grew into the professional strategic fighting force we know today. Also under their guidance, the early assigned World War II aircraft gave way to the post war propeller driven bombers — the B-17, and B-29 are in this category. In 1948, two new aircraft — the B-36 and B-50 — were delivered to SAC and inflight refueling was introduced giving SAC's bombers intercontinental range. It was also in that year that General LeMay took command and SAC Headquarters was relocated at Offutt AFB.

During the Korean War, SAC B-29s made history in their first real test of combat readiness, dropping 167,000 tons of conventional bombs and destroying every strategic industrial target in North Korea in three months. In August 1953, the explosion of the first Soviet hydrogen bomb emphasized the nuclear threat and all phases of SAC training were pushed ahead at full speed.

Both the B-47 and KC-97 entered the SAC inventory in 1951 and each served proudly until the mid sixties.

Delivered to SAC in 1957, the KC-135 has made a proud mark in aviation history. The '135 presence in Southeast Asia represented the first conflict in which combat bomber and fighter aircraft were provided with essential airborne fuel supplies.

New aircraft were swiftly introduced to replace older obsolete systems. By the mid-fifties, the first all-jet B-47 bomber had replaced B-29s and B-50s. At that time, the KC-97 was the main refueling tanker. Before General LeMay's reassignment in 1957, SAC's inventory included the B-52 and KC-135 and the non-stop around the world "Power Flite" of three B-52s had demonstrated the command's worldwide capability.

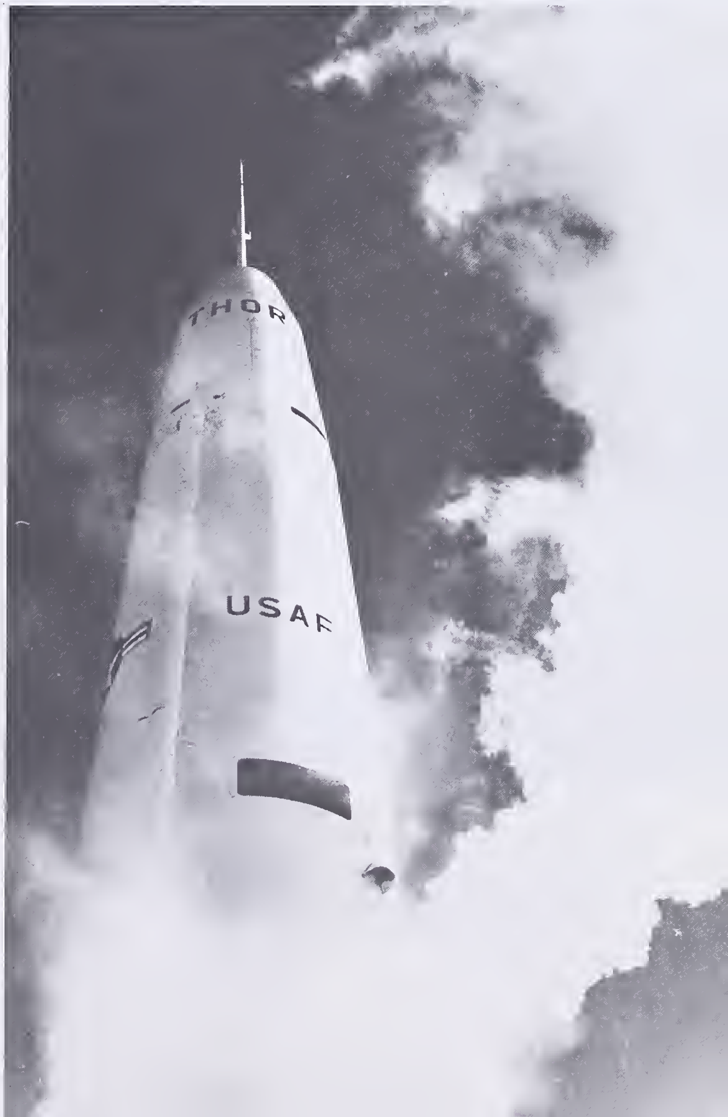
By the end of the fifties, one-third of the bomber force was on 15-minute ground alert, and airborne alert and dispersal concepts were being tested to counteract decreasing warning times.

General Thomas S. Power, SAC's third commander, supervised the integration of intercontinental ballistic missiles into the force during his tour from 1957 to 1964. Atlas and Titan wings were activated in 1958 and Snark, Hound Dog, and Minuteman soon became familiar terms in describing the mixed force of manned and unmanned systems.

When the Cuban missile crisis erupted in 1962, SAC was ready. With B-47s poised for immediate takeoff, B-52s flying airborne alert, and the growing missile force on alert, the command formed a strategic umbrella under which American diplomacy was able to resolve the tense situation.

Since 1946, SAC commanders have molded the command into its present configuration of 1,054 ICBMs, and approximately 450 bombers and 600 KC-135 tankers. During this period, modernization of weapons and techniques continued. The B-58 served from 1960 to 1969 as the first supersonic nuclear bomber, the U-2 and SR-71 recon-

SAC's Thor, circa 1956.



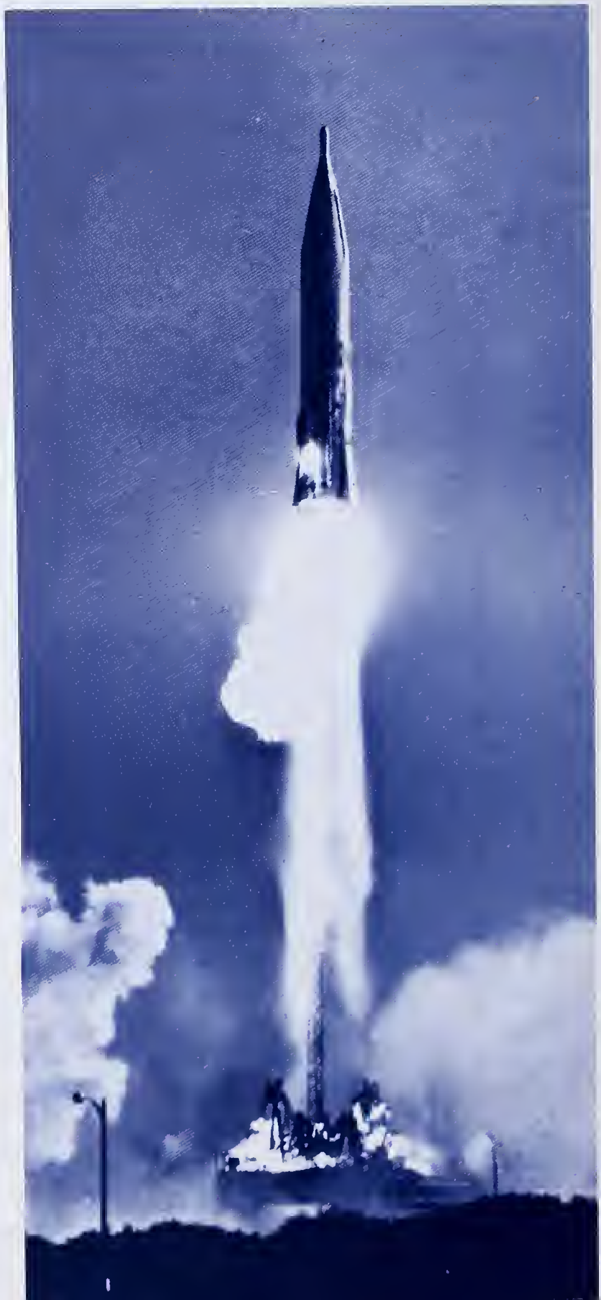
The Strategic Missiles — In March 1956, SAC was assigned the responsibility of deploying the Thor IRBM to England and bringing it to a combat ready status. Since then, several strategic missile systems, including the Atlas, Titan and Minuteman have added their contributions to SAC's deterrent mission. Today the Titan II and the Minuteman stand ready as a formidable force for peace.

naissance aircraft were introduced, the MIRV-capable Minuteman III became a reality, and conventional bombing and KC-135 refueling in Southeast Asia once again displayed the command's flexibility and resolve.

Faced today with straining budgets and the Soviet strategic buildup, our leaders stress the need for continued modernization. Quality improvements to the Minuteman missile force and a follow-on advanced bomber to replace older B-52s are seen essential for the maintenance of realistic credible deterrence in the years ahead.

THE RECORD FOR SAFETY

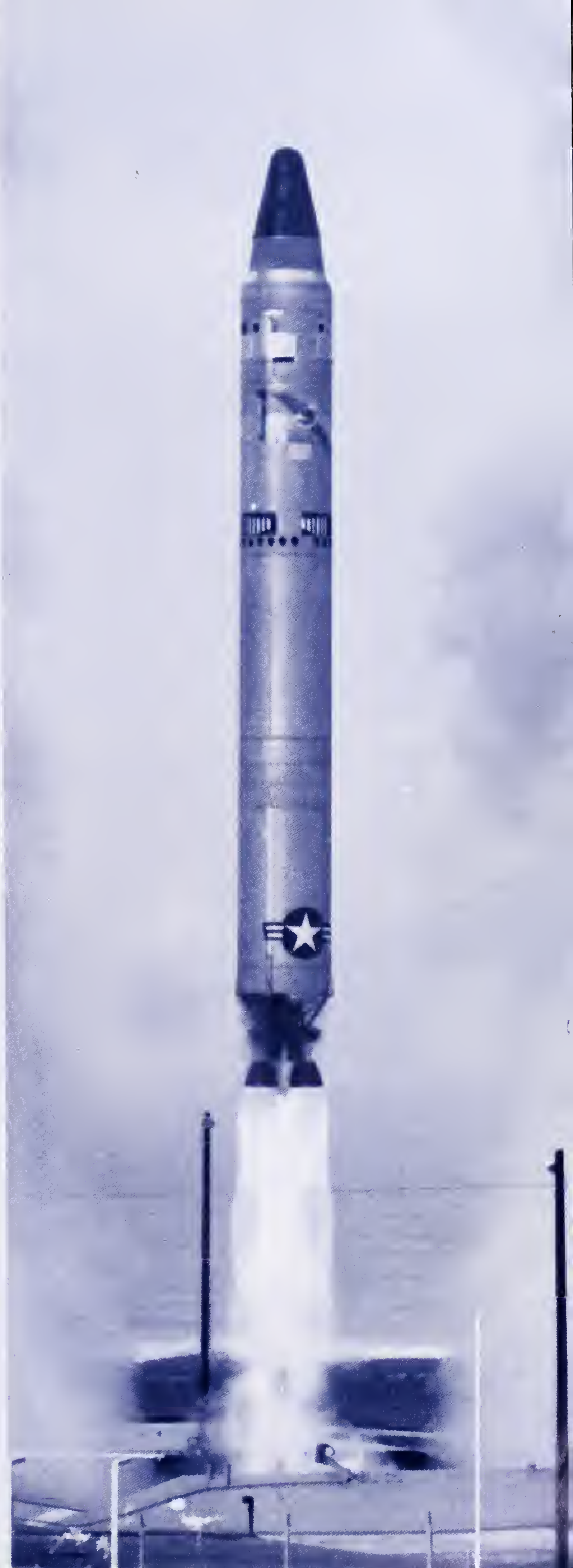
Throughout the 30 years of its history, SAC has been faced with many problems. Not the least of these problems was the unacceptably high aircraft accident rate that accompanied the buildup of the nation's strategic air arm — a rate that drained away irreplaceable manpower and weapon systems. In



Today SAC's aircrews and missile crews stand ready to meet the challenge of the future.

the formative years, when SAC first moved to Offutt Air Force Base, flying safety was a problem of the first order and General Curtis E. LeMay set out to correct that situation. First, he pulled in one of his top commanders and directed that a SAC-wide flying safety program be set up with the emphasis on supervision and tech data. Secondly, he established Combat Crew magazine to "educate" all personnel with the emphasis on crewmembers and maintenance personnel. From this first concentrated attack on the aircraft accident rate, flying safety in SAC evolved into a professional and effective effort that has proven accidents can be prevented.

In 1946, the aircraft accident rate per 100,000 flying hours stood at 75.48. Today, that rate stands at an unusually low .96. This vast improvement was accomplished over the years in spite of tremendous expansions in training, the steady increase in numbers of flying personnel, and the increased complexity of weapon systems. The complete story of this notable reduction of aircraft accidents through the years is best shown in the chart depicted on page 3. Since the early years, the scope of SAC safety has expanded significantly. Today, the safety effort is pointed not only at flying but also missile, nuclear, ground and explosive. In each area, significant improvement has been achieved in reducing the loss of valuable life and equipment.



In July 1968, the 340th Bomb Group, was organized at Carswell. The 340th was scheduled to be the first SAC unit to receive FB-111 aircraft and their mission was to train combat crews in the operation of the new bomber. Classed as a medium bomber, the "FB" is capable of Mach 2+ speed and can operate at an altitude of 60,000+ feet. Today two medium bomb wings are equipped with FB-111As.

In 1966, the reconnaissance force was strengthened immeasurably with the delivery of SAC's first SR-71.

SAC Safety Screen

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW SACR 127-2.*

410 BMW, K I Sawyer Crew E-123: AC Capt John H Hinton, CP #1 Capt Eric L A Lee, CP #2 1/Lt Richard E Fitzhugh, N Capt Richard D Ballas, BO SSgt Richard L Brian

68 BMW, Seymour Johnson Crew E-16: FP Capt Edward R Gonser, CP Capt Robert L Suter II, CP 1/Lt Brooke R Kimes, RN Capt James W McClellan, NN 1/Lt Bennie H Burnette Jr, EW 1/Lt Randall M Enright, AG SSgt Marvin L Moye

19 BMW, Robins Crew S-103: P Capt Richard E Peschke, CP Capt James T Rudd III, N Maj Howard C Usher Jr, BO MSgt Larry L Treiber

97 BMW, Blytheville Crew E-115: FP Capt Buddy W Burkhart, CP 1/Lt Dan A McCaskill, NN 1/Lt Fred W Anthony, BO SSgt Gordon T Daffern

5 BMW, Minot Crew R-118: P Capt James W Barr, CP 1/Lt Joseph M Hellenberg, NN 1/Lt Paul A Tidwell, BO SSgt Timothy C Wicall

6 SW, Eielson Crew E-03: P Capt K D Lykken, CP 1/Lt R L Deason, IN Capt L J Bell, NN Capt R M Shields

6 SW, Eielson Crew E-15: TC Maj J E Kruger, R1 Capt P D Brown, R2 Capt G C Ciz, R3 Capt C F Pitts, R4 Capt G W Bowder, MT Capt M L Luke, SC Capt J D Hanscom, PT SSgt D J Spradling, ET Sgt M L Wellbaum

22 BMW, March Crew S-101: P Capt Thomas A Manzari, CP 1/Lt Jon D Hanson, NN Capt George E Morrow, BO MSgt William M Talley

55 SRW, Offutt Crew S-102: IP Maj Paul M Arthur, CP Capt Stephen V Gagliano, CP 1/Lt Johnnie E Boyle, IN Maj William C McRae, BO MSgt Royce H Gee Jr

92 BMW, Fairchild Crew E-21: P Capt Keith W Barngrover, CP Capt Rodney W Young, RN 1/Lt Robert L Andrews, NN Capt Howard G Carson, EW 1/Lt Carl E Anderson, AG A1C Gene A Griffin

96 BMW, Dyess Crew R-110: P Capt Daniel A Agostini, CP 1/Lt Richard V Smith, IN Capt Timothy J Myers, IBO CMSgt Casimir E Ziolokowski

308 SMW, Little Rock Crew R-062: MCCC Capt Donald G Morrow, DMCCC 1/Lt James L Wilks, MSAT A1C Steven E Black, MFT A1C Charles J Johnson

341 SMW, Malmstrom Crew E-062: MCCC 1/Lt Bruce Lamartine, DMCCC 2/Lt Robert Ladow

44 SMW, Ellsworth Crew S-150: MCCC Capt John S Rutter, DMCCC 2/Lt Gary J Archambault

90 SMW, F E Warren Crew E-145: MCCC Capt Charles C Cummins, DMCCC 1/Lt James A Aneshansley

91 SMW, Minot Crew S-021: MCCC Capt Davis A LaBar, DMCCC 2/Lt Alan H Payne

308 SMW, Little Rock Crew R-048: MCCC Capt Barry A Eller, DMCCC 1/Lt John C Watson, MSAT A1C Steven M'Brake, MFT Sgt William J Morehouse

351 SMW, Whiteman Crew S-200: MCCC Maj Jerry D Adinolfi Jr, DMCCC 1/Lt James R Willis

381 SMW, McConnell Crew R-183: MCCC Capt William L Crawford, DMCCC 2/Lt Rudolph H Gieschen Jr, MSAT TSgt William J Peterson, MFT Sgt Kenneth D Cooper

341 SMW Malmstrom Crew R-185: MCCC Capt Thomas Luisi, DMCCC Capt Larry G Hoover

390 SMW, Davis-Monthan Crew R-180: MCCC Capt Jack E Nelson, DMCCC 1/Lt William E Hetzler, MSAT SSgt Terry L Keefer, MFT A1C Richard G Gibson

U.S. Government Printing Office
1976/665-702/7

UNIVERSITY OF FLORIDA
3 1262 09304 8469

In the SPIRIT of '76'

RARE

I was to lead Strategic Air Command — there wasn't much at Offutt except a big bomber plant and a cockeyed runway. We moved the entire headquarters into the bomber plant . . . all of SAC — the total command — wasn't very big at that time. You might call that just about our darkest night. There was much to learn.

As for the world situation, we were standing on a loose, slippery pile . . . my determination was to put everyone in SAC into this frame of mind: We are at war now! If we did go to war the very next morning, we would stumble through no period in which nations would be wasted . . . We had to be ready to go. Our people must be combat ready and combat wise. First one group, then another.

The SAC which was, would never have become the SAC which is, if everybody had sat on the ground . . . we went out to fly! An organization like this couldn't be cobbled together overnight. It took years, and it took a lot of personnel who believed the way I believed. They must be given credit, and will be as long as I'm alive!

Less than five days after General MacArthur requested SAC's assistance in the Korean War, our B-29's were flying missions against enemy targets. To reach this state took time and effort . . . The feat was accomplished by people who had been ground right through those engines, and were willing to stay on the job. I don't think America would be alive today if it were not for them!

General Curtis E. LeMay
Remarks from his book "Mission With LeMay," published in 1965.